Claims

1. Actuator, comprising a housing (1) accommodating a screw mechanism (2) and a drive comprising a motor (3), said screw mechanism (2) comprising a nut (4) and a screw (5) one of which is rotatably supported with respect to the housing (1), such that upon relative rotation of the nut (4) and the screw (5) a linear movement of one of said nut (4) and screw (5) is obtained, characterised in that at least a rotatable component of the drive, e.g. the rotor (19) of the motor (3), is rotatably supported on the screw (5) which is rotatably supported with respect to the housing.

2. Actuator according to claim 1, wherein the screw (5) is rotatably supported with respect to the housing (1) by means of a support bearing (11).

3. Actuator according to claim 2, wherein the rotatable component of the drive, e.g. the rotor (19) of the motor (3) is rotatably supported on the screw (5) by means of an auxiliary bearing (52).

4. Actuator according to claim 3, wherein the support bearing (11) is accommodated within the auxiliary bearing (52).

5. Actuator according to claim 2, 3 or 4, wherein the screw (5) is integrated with the outer ring (10) of the support bearing (11).

6. Actuator according to claim 5, wherein the outer diameter of the outer ring (10) of the support bearing (11) is larger than the outer diameter of the screw (5).

7. Actuator according to any of claims 2 - 6, wherein the outer ring (10) of the bearing (11) supports a rotatable sleeve (31) which is in connection with the rotatable component (19) of the drive.

8. Actuator according to claim 7, wherein the sleeve (31) comprises, or is connected to, the integrated outer ring of an auxiliary bearing, the inner ring of which is integrated with the outer ring (10) of the support bearing (11).

9. Actuator according to claim 8, wherein the sleeve (31) comprises two axially spaced raceways, each of said raceways engaging a number of rolling elements (20) which each engage a raceway on the outer surface of the outer ring (10) of the support bearing (11).

10. Actuator according to claim 7, 8 or 9, wherein the sleeve (31) is connected to the rotor (19) of the motor (3).

11. Actuator according to any of the preceding claims, wherein one of the nut (4) and

screw (5) is rotatably supported both according to an axis parallel with respect to said linear movement, and according to at least one axis transverse with respect to said linear movement.

12. Actuator according to claim 11, wherein one of the nut (4) and screw (5) is supported with respect to the housing by means of a ball joint (13).

13. Actuator according to claim 12, wherein the ball joint (13) is at one end of a central support shaft (16), the other end of which is connected to the housing (1).

14. Actuator according to claim 13, wherein the ball joint (12) is connected to a support bearing (11), said support bearing (11) supporting the screw (5), said one of the nut (4) and the screw (5) being drivably connected to the rotor (19) of the motor (3).

15. Actuator according to claim 14, wherein said one of the nut (4) and the screw (5) engages the rotor (19) through a coupling (25, 27) which allows rotations about at least one axis transverse with relation to the linear movement.

16. Actuator according to claim 15, wherein the coupling comprises an internally toothed member (26) as well as an externally toothed member (24) having equal number of teeth (25, 27).

17. Actuator according to claim 16, wherein the teeth (25) of the externally toothed member (24) are convexly curved in a cross-section parallel to the linear movement.

18. Actuator according to claim 16 or 17, wherein the teeth of the externally toothed member (24) are centred with respect to the ball joint (13).

19. Actuator according to any of claims 14-18, wherein the screw (5) is integrated with the outer ring (10) of the support bearing (11).

20. Actuator according to claim 19, wherein the outer diameter of the outer ring (10) of the support bearing (11) is larger than the outer diameter of the screw (5).

21. Actuator according to claim 19 or 20, wherein the outer ring (10) of the support bearing (11) is integrated with an internally toothed member (26).

22. Actuator according to claim 20, wherein the screw (5) and the internally toothed member (26) are at axially opposite ends of the outer ring (10) of the support bearing (11).

23. Actuator according to any of claims 19-22, wherein the rotor (19) of the motor (3) is rotatably supported on the outer ring of the support bearing (11).

24. Actuator according to claim 23, wherein the rotor (19) engages an externally toothed member (24) through a reduction gear mechanism (22).

25. Actuator according to claim 24, wherein the support bearing (11) is supported on one end of a support shaft (16), the other end of which is connected to the housing (1), the externally toothed member (24) being rotatably supported on said support shaft (16).

Sub Q27

26. Actuator according to claim 19 or 20, wherein the rotor of the motor directly engages the outer ring of the support bearing.

Sub Q28

27. Actuator according to claim 26, wherein the rotor is integrated with an internally toothed member, and the outer ring of the support bearing is integrated with an externally toothed member, said members engaging each other.

Sub Q29

28. Actuator according to claims 13-27, wherein the screw (5) and the support shaft (16) each have a throughgoing bore, said bores being aligned with respect to each other.

29. Actuator according to any of claims 1-28, wherein the screw (5) comprises a bore, said bore containing a grease dosing unit (53).

30. Actuator according to any of the preceding claims, wherein at least one of the components of the screw mechanism, support bearing, auxiliary bearing and reduction gear mechanism comprises a surface obtained by hard turning.

31. Actuator according to any of the preceding claims, wherein at least one of the components of the screw mechanism, support bearing, auxiliary bearing and reduction gear mechanism comprises a coating, e.g. a diamond-like carbon coating.

32. Actuator according to any of the preceding claims, wherein an encoder is provided for measuring a relative rotation.

Sub Q24

33. Brake calliper for a disc brake, comprising a claw piece carrying at least two opposite brake pads which enclose a gap for accommodating a brake disc, and an actuator according to any of the preceding claims, said actuator having a housing accommodating a screw mechanism and a drive comprising a motor, said screw mechanism comprising a nut and a screw one of which is rotatably supported with respect to the housing, such that upon relative rotation of the nut and the screw a linear movement of one of said nut and screw is obtained, said housing being connected to the claw piece, characterised in that at least a rotatable component of the drive, e.g. the rotor of the motor, is rotatably supported on the ~~nut or~~ screw which is rotatably supported with respect to the housing.